HEC Past Paper (Phase-I)

Held on: 13th of August 2017.
Total Marks: 120

Paper Pattern

Sr.	Subject	Total MCQs
1	Biology	40
2	English	20
3	Chemistry	30
4	Physics	30

BIOLOGY

Q1. The excretory product that requires minimum water for its elimination compare to others:

a) Creatinine
b) Ammonia
c) Urea
d) Uric Acid

Q2. When a hemophilic carrier woman marries a normal man, who among her offsprings may be affected:

a) All her children
b) All her daughters
c) Half of her daughters
d) None of above

Q.3 The oxygen bonding protein present in the skeletal muscles is:

a) Globin
b) Glycogen
c) Myoglycogen
d) Myoglobin

Q.4 ADH which actively transports water from filtrate in collecting tubules back to kidney is released by:

a) Pituitary Gland
b) Adrenal Gland
c) Rectal Gland
d) Both a & c

Q.5 Homeostasis thermostat is present in brain:

a) Hypothalamus
b) Medulla
c) Cerebrum
d) Pons

Q.6 Pulmonary veins supply blood to heart chamber

a) Right atrium
b) Left atrium
c) Right ventricle
d) Left Ventricle

Q.7 Sensation of pleasure, punishment or sexual arousal when stimulated by the parts of brain:

a) Hippocampus
b) Hypothalamus
c) Amygdala
d) Thalamus

Q.8 Goiter is one of the abnormalities due to the deficiency of hormone:

a) Adrenaline
b) Thyroxin
c) Oxytocin
d) Parathormone

9. Which bond is present between the nucleotides of DNA:

a) Peptide bond
b) Phosphodiester bond
c) Glyosidic bond
d) Ester bond

10. Two parents one haemophilic & other carrier, chances among the male offspring to be haemophilic:

a) 25 %
b) 50%
c) 75%
d) 100%

11. Dark reaction of photosynthesis takes place:

a) Grana
b) Stroma
c) Thylakoid
d) Both a & b

12. Uncontrolled production of WBCs results in a disorder called:

a) Leucaemia
b) Oedema
c) Thalassaemia
d) Atherosclerosis

13. Which triain is not sex-linked recessive:

a) Haemophilia
b) Colour blindness
c) Hypophosphatemic ricket
d) tfm syndrome

14. Plants of this group are called ferns:

a) Filicinae
b) Angiospermae
c) Gymnospermae
d) All of them

15. The mechanism by which organisms stability of cellular movement is known as:

a) Homeostasis
b) Natural health
c) Structural adaptation
d) Osmoregulation

16. When the concentration of external medium is equal to the concentration of internal medium of cell, the situation is called:
a) Hypertonic
b) Hypotonic
c) Isotonic
d) Heterotonic

17. Brassica and rose plant belong to the group of plants:
a) Hydrophytes
b) Mesophytes
c) Xerophytes
d) Succulant

18. Animals which are unable to adjust their internal salt concentration according to external environment is:
a) Anhydrobiosis
b) Osmoregulators
c) Thermoregulatory
d) Osmoconformers

19. Which of the following animal can survive without drinking water?
a) Kangaroo rat
b) Pig
c) Kangaroo
d) Camel

20. Nitrogenous wastes are produced as a result of:
a) Photosynthesis
b) Ingestion
c) Assimilation
d) Deamination

21. Fresh water proteroants pumped out excess water by a special structure called:
a) Oral groove
b) Contractive vacuole
c) Vesicle
d) Vacuole

22. The word glycogenesis means, the conversion of:

a) Glucose to glycogen
b) Lactic acid to glycogen
c) Glycogen to glucose
d) Amino acid to glycogen

23. Which of the following nitrogenous compound is much more soluble in water?
a) Uric Acid
b) Urea
c) Ammonia
d) Creatine

24. It is the smallest eukaryote:
a) Virus
b) Bacteria
c) Plasmodium
d) Sponge

25. Trypsinogen is activated by:
a) Chymotrypsin
b) Enteropeptidase
c) Trypsin
d) HCL

26. Role of lysosomes are:
a) Hydrolytic enzymes
b) Autophagy
c) Destruction of cell
d) All of above

27. Which of the following statement is incorrect:
a) Competitive inhibitor binds to alternative site
b) The substrate binds to active site
c) Enzymes work best in low pH
d) Both a & b

28. All of the following are characteristics of kingdom fungi except:
a) Heterotrophy
b) Sessile
c) Cell wall
d) All of above

29. Italic is the scientific name of a
a) Fungus
b) Smut

c) Bacterium
d) Yeast

30. The stored food in fungi is usually lipid droplets of:
a) Glucose
b) Glycogen
c) Starch
d) Protein

31. The haploid number of chromosomes in human beings:
a) 4
b) 10
c) 24
d) 23

32. Rod shaped bacteria are known as:
a) Cocci
b) Bacilli
c) Spirilla
d) None of these

33. Curve screw shaped bacteria are known as:
a) Cocci
b) Bacilli
c) Sprilla
d) None of these

34. In many bacteria cell wall is enclosed within a slime capsule made up of:
a) Polysaccharides
b) Cellulose
c) Amino Acids
d) Proteins

35. The DNA of the bacterium is present in distinct region called:
a) Nucleolus
b) Centrosome
c) Nucleoid
d) Nucleus

36. The cellular DNA of a bacterium is known as the
a) Plasmid
b) Genes
c) Chromosomes
d) Histone

37. The bacteria can cope unfavourable condition by producing

a) Mesosomes
b) Zygospores
c) Endospores
d) Cysts

38. The cell membrane of a bacterial cell often invaginates to produce membranous structures referred to as:

a) Centrosomes
b) Mesosomes
c) Dictyosomes
d) Polysomes

39. Mitosis can't take place in bacteria because they lack ---

a) Chromosomes
b) Nucleus
c) Centrosome
d) Mesosomes

40. Apparently which bacteria is more resistance to antibiotics?

a) Gram positive bacteria
b) Gram negative bacteria
c) Both a & b
d) None of these

ANSWERS							
1	D	11	B	21	B	31	D
2	A	12	A	22	C	32	B
3	D	13	C	23	B	33	C
4	A	14	A	24	C	34	A
5	A	15	A	25	B	35	C
6	A	16	C	26	D	36	A
7	C	17	B	27	D	37	C
8	B	18	B	28	E	38	B
9	B	19	A	29	D	39	B
10	B	20	D	30	B	40	B

ENGLISH

41. He invited ____ and Zia to dinner.

a) we
b) you
c) us
d) them

42. Neither they nor their friend ____________ solved the question.

a) has
b) have
c) was
d) were

43. He asked me_______________.

a) how are you.
b) how was I?
c) how you are?
d) How I was.

44. She asked me _________________.

a) bring a glass of water for her.
b) to bring a glass of water for me.
c) to bring a glass of water for her.
d) None of these

45. When your friend ______________, he'll be very tired.

a) arrived
b) will arrive
c) arrives
d) is arriving

46. The sentence which has one dependent and one independent class is called _______.

a) Compound Sentence
b) Complex Sentence
c) Compound Complex Sentence
d) Exclamatory Sentence

Pick up the wrong one:

47. The beautiful and the most attractive picture was hanged on the wall.
A B C D

48. Though I thought I had hardly left any book unread. I am surprised that I have read none of these two books.
A B C D

49. **Each of the defaulters <u>were</u> heavily <u>fined</u> for <u>delay</u> in <u>payment</u> of dues.**
A B C D

50. **<u>Nothing</u> can be <u>helpful</u> to <u>check</u> the evils <u>than</u> the fear of God.**
A B C D

51. **<u>Neither</u> <u>Promises</u> <u>have</u> been kept, <u>regardless</u> of numerous opportunities to do so.**
A B C D

For Question 52-53 choose the word most similar in meaning to the given.

52. **REAL:**
- a) Copied
- b) Idea
- c) Original
- d) Given

53. **ABSOLUTE:**
- a) Division
- b) Complete
- c) Small
- d) Half

54. **UNFOLD:**
- a) Conceal
- b) Withhold
- c) Maintain
- d) Elaborate

55. **COMMENCE:**
- a) To End
- b) To Begin
- c) Nearing Finish
- d) To Run

For Question 56-57 choose the word nearly opposite in meaning to the given word.

56. **ANXIETY:**
- a) Problem
- b) Worry
- c) Relaxed
- d) Nervous

57. **FORTH:**
- a) Back
- b) Out
- c) Into view
- d) Onward

For Question 58-60 identify the word or phrase that needs to be changed for the sentence to be correct:

58. **He called me as a fool.**
A B D

59. **This is the house where Jack was born in.**
A B C D

60. **I have visited them a couple of times during my stay in Mexico.**
A B C D

ANSWERS					
41	**B**	**49**	**A**	**57**	**A**
42	**A**	**50**	**B**	**58**	**B**
43	**D**	**51**	**C**	**59**	**D**
44	**C**	**52**	**C**	**60**	**A**
45	**C**	**53**	**B**		
46	**B**	**54**	**D**		
47	**A**	**55**	**B**		
48	**D**	**56**	**C**		

CHEMISTRY

61. **The amount (in litres) of Oxygen at STP that is required for the combustion of 4gm of ethylene is:**

a) 96 litres
b) 9.6 litres
c) 44.8 litres
d) 67.2 litres

62. **CO_2 and O_2 diffuse in the ratio of 0.58:0.55 what is the mass of O_2:**

a) 2.44
b) 23.2
c) 48.93
d) 2.32

63. **H_2 and O_2 are diffusing under same condition how much H_2 gas will diffuse**

a) 4
b) 16
c) 32
d) 0.5

64. **The value of surface tension of isopropyl alcohol is:**

a) Less than water
b) Less than ethylene glycol

c) Less than methyl alcohol
d) Same as ethyl alcohol

65. A solution of Sodium Sulphate was electrolyzed using some inert electrode; the products at the electrodes are:
a) O_2, H_2
b) O_2, Na
c) O_2, SO_2
d) O_2, $S_2O_4{}^{-2}$

66. Which order reaction obey the expression $t_{1/2} = \frac{1}{Ka}$
a) First
b) Second
c) Third
d) Zero

67. Which of the following indicate the correct variation of electro negativity
a) F > N > O > C
b) F > N < O > C
c) F <N < O < C
d) F > N > O < C

68. The products of decomposition of $Mg(NO_3)_2$ are
a) MgO and NO2
b) Mg and NO2
c) MgO, NO2, O2
d) Mg(NO3)2

69. If a person is injected by shot of a gun and all the bullets are not removed from his body it may cause poisoning by
a) Hg
b) Pb
c) Fe
d) As

70. Nitric Oxide has valence electrons.
a) 10
b) 13
c) 11
d) 12

71. Which metal is used generally for the filament of electric bulbs?
a) Pt
b) Fe

c) Cu
d) W

72. Maleic Acid and fumaric acid are

a) Cis-Trans isomers
b) Chain isomers
c) Position isomers
d) Metamers

73. All of the following react with $KMNO_4$ but

a) Ethane
b) Ethyne
c) Ethyl benzene
d) Ethene

74. The test used to distinguish among Primary, Secondary and Tertiary alcohols

a) 2,4 – DNPH test
b) Tollen's test
c) Lucas Test
d) Fehling's Solution Test

75. In the reaction sequence: $CaC_2 \xrightarrow{H_2O}$ A B C. Identify the product 'C'.

a) CH_2OH
b) CH_3CHO
c) C_2H_5OH
d) C_2H_4

76. Which one of the following organic compound has the least carbon-carbon bond length?

a) Ethene
b) Ethane
c) Ethyne
d) Methane

77. The reaction 2RX+2Na→ RR+2NaX is an example of:

a) Cannizaro's reaction
b) Kolbe's reaction
c) Sabatier & Senderens's reaction
d) Wurtz reaction

78. Which is not a meta directing group:

a) $-NO_2$
b) $-COOH$
c) $-NH_2$
d) $-COR$

79. Which one of the following free radical is most stable:

a) CH_3^+

b) $(CH_3)_2CH^+$

c) $(CH_3)_3C^+$

d) $C_2H_5^+$

80. The process of depositing a thin layer of expensive metals on ordinary or expensive metals is called:

a) Electroplating

b) Conductivity

c) Galvanizing

d) Meallurgy

81. A catalyst is a substance which:

a) Stops the reaction

b) Decreases the rate of reaction

c) Alters the rate of reaction

d) Increases the rate of reaction

82. For a single step reaction A → B + 2C, the rate law is:

a) Rate = k——

b) Rate = k [A][B]

c) Rate= k

d) Rate = k [B]

83. The correct increasing order of electron affinity value of atoms is:

a) I < Br < F < Cl

b) I < Cl < F < Br

c) I < F < Br < Cl

d) F < Cl < Br < I

84. The elements with atomic numbers 10, 18, 36, 54 and 86 are:

a) Light metals

b) Inert gases

c) Halogens

d) Rare earth metals

85. The relation between first and second ionization potentials of a given atom is:

a) I1 < I2

b) I1 > I2

c) I1 = I2

d) None of above

86. Commercial hydrogen can be obtained by the action of a steam on:

a) Marsh gas
b) Coal gas
c) Producer gas
d) None of these

87. The number of isomers of C_3H_7-Cl

a) 2
b) 3
c) 4
d) 6

88. Which class of the compounds is represented by the type formula ROR'?

a) Esters
b) Ethers
c) Aldehydes
d) Ketones

89. Formalin is an aqueous solution of:

a) Formic acid
b) Formaldehyde
c) Furfurabldehyde
d) Acetone

90. In this reaction, $NH4^+ + H_2O \rightarrow H_3O^+ + NH_3$ the conjugate base of H_3O^+ ion is:

a) NH_4^+
b) H_2O
c) H^+
d) NH^3

ANSWERS					
61	B	71	D	81	D
62	C	72	A	82	B
63	A	73	A	83	A
64	D	74	C	84	B
65	A	75	C	85	A
66	B	76	C	86	A
67	B	77	D	87	A
68	C	78	C	88	B
69	B	79	C	89	B
70	C	80	A	90	B

PHYSICS

91. **An object is thrown vertically upward with a velocity of 20m/s. How much time it will take to reach the highest point?**

a) 2 sec
b) 4 sec
c) 1 sec
d) Insufficient information

92. **Suppose you drop an object from the roof of your house. It takes 2 sec. to reach the ground. What is the height of your house?**

a) 10 m
b) 20 m
c) 5 m
d) Insufficient information

93. **The dimension of Young's Modulus is**

a) $M^2L^{-1}T^2$
b) $ML^{-1}T^{-1}$
c) $ML^{-1}T^{-2}$
d) $ML^{-2}T^{-2}$

94. **The length and width of a rectangular plate are measured to be 15.3mm and 12.50mm. Find the area of plate upto appropriate number of significant figure.**

a) 195.84 mm^2
b) 195.8mm^2
c) 196mm^2
d) 200mm^2

95. **An alternate unit to $kgms^{-1}$ is**

a) N
b) Nm^2
c) Nm
d) Ns

96. **A force F= 0.12N is applied on a spring and spring elongates by 3cm. Specific constant of the spring is?**

a) 0.4 Nm^{-2}
b) 40 Nm^{-1}

c) 400 Nm^{-1}

d) 4 Nm^{-1}

97. A vector in space has ______ dimension:

a) 0

b) 1

c) 2

d) 3

98. A body will be in translational equilibrium if the vector sum of all the forces acting on it is:

a) 0

b) Min.

c) Max.

d) Equal

99. In rotator motion angular momentum plays a role which is analogous to that played by ______ in linear motion.

a) Linear velocity

b) Linear momentum

c) Linear acceleration

d) Inertia

100. In Young's Double slit experiment, if the spacing between the slit is doubled and the linear distance from the screen is reduced to one half then the spacing between the two adjacent bright fringes will be _____ of actual value.

a) remain same

b) reduce to one half

c) reduce too one quarter

d) increase to twice

101. Consider an object is placed on a frictionless inclined plane at a height of 5m, if it is released, what will be its velocity at the bottom of the inclined plane?

a) Insufficient information

b) 10m/s

c) 100m/s

d) 20m/s

102. A cricketer hits 4 runs, When middle of the bat hits the ball. This is an example of Newton's:

a) 2nd la w of motion

b) 3rd law of motion

c) 1st of motion

d) Law of gravity

103. k̂ x î

a) ĵ

b) -ĵ

c) k̂

d) -k

104. The object at equilibrium may have any:

a) Force acting upon it

b) Acceleration

c) Velocity

d) Torque acting upon it

105. A guy is standing in a lift falling freely under gravity releases a ball from hand. As seen by the ball, the boy

a) falls down

b) remains stationary

c) goes up

d) none of above

106. Wheat stone bridge is used to:

a) Compare resistances

b) Determine the current

c) Determine the charge

d) Determine the e.m.f

107. Lower fixed point of Celsius Scale is

a) 32 ^{o}C

b) 273 ^{o}C

c) O ^{o}C

d) 100 ^{o}C

108. According to the Guass's law, electric field intensity between two oppositely charged parallel plates is

a) 0

b) —

c) —

d) —

109. A fused can be savior against:

a) High voltage

b) High current

c) High power

d) Heating of wires

110. A current of 2A is passing though an inductor of 2mH. Energy stored by it is

a) 8mJ

b) 10mJ

c) 6mJ

d) 4mJ

111. Volume stress divided by volume strain equal to

a) Young's Modulus

b) Bulk Modulus

c) Shear Modulus

d) Hyper Modulus

112. A factor buys 100kg of radioactive chemical with a half-life of 5 years which decays to a stable compound. How much of the chemical will still be radioactive in 10 years' time

a) None

b) 25kg

c) 50kg

d) 75kg

113. Alpha, Beta and Gamma radiations are emitted from a radioactive substance:

a) When it is heated

b) When it is subjected to high pressure

c) When it interacts with another particle

d) Spontaneously

114. Change in entropy doesn't depend on:

a) Amount of heat added to the system

b) Amount of heat rejected from the system

c) Temperature of the substance

d) Amount of the substance

115. A frictionless heat engine can be 100% efficient if:

a) The temperature of the sink is 0 ^{o}C

b) The temperature of the sink is 0 ^{o}K

c) The temperature of the source is 0 ^{o}K

d) The temperature of the sink is equal to the temperature of the source

116. A body moving with velocity V can be stopped by a force F in direction of it. Same body moving with velocity 5V can be stopped by a force 5F in distance equal to:

a) X

b) 5x

c) 10x

d) x/2

117. One wheel has a diameter of 30 inches and a second wheel has a diameter of 20 inches. The first wheel travels a certain distance revolution in 240 revolutions. In how many revolutions did the second wheel travel the same distance.

a) 170

b) 160

c) 360

d) 420

118. Dark plastic handlers often used on kitchen utensils because:

a) The black material is good in radiation

b) The plastic is a good insulator

c) The plastic a good conductor

d) The plastic soften gradually with excessive heat

119. A parallel plate capacitor has a capacitance C. If the distance between the plates and the plates both halved. Now the capacitance will be?

a) 0.5C

b) 4C

c) 0.25C

d) C

120. Which of the following statement is true about energy in a quantum:

a) It varies directly with frequency

b) It is the same at all frequencies

c) It varies with frequency

d) None of the above choices

ANSWERS					
91	A	101	B	111	B
92	B	102	B	112	B
93	C	103	A	113	D
94	C	104	C	114	D
95	D	105	B	115	B
96	D	106	A	116	B
97	D	107	C	117	C
98	A	108	B	118	B
99	B	109	B	119	D
100	C	110	C	120	A